Chapter 4 Environmental Consequences

This chapter presents the environmental impacts and associated mitigation of the proposed Preferred Alternative as compared to the impacts and mitigation of the FEIS Alignment.

Construction Activity Impacts and Mitigation

The impacts and mitigation associated with the construction activities for this project are covered in, and are unchanged from, the FEIS. For this information please refer to the FEIS, p. 4-248 through 4-276.

All impacts and mitigation described in this chapter refer to operational impacts of the project.

Biological and Physical Impacts

Air Quality

As a Serious Non-Attainment area for carbon monoxide (CO) pollution, Spokane must ensure that it can meet, or exceed, the NAAQS by December 31, 2000. This commitment is demonstrated through the development of a Serious CO State Implementation Plan (SIP). Transportation plans, programs, and projects, such as the NSC, must conform to the air quality goals of the SIP by not preventing the attainment of the NAAQS. From a regional perspective, SRTC has reviewed the NSC for consistency with the SIP and has found the project to be conforming to the SIP for attaining the NAAQS in the Spokane Non-Attainment Area.

The NSC, because of its scope and cost, has a relatively long timeline for construction, with phases opening at various times during an indeterminate construction period due to the uncertainty of funding. WSDOT recognizes that as phases are implemented additional project-level air quality analysis will be required to ensure that each phase of the NSC will not create a new exceedance nor exacerbate an existing exceedance of the NAAQS CO pollution levels at intersections impacted by the NSC. Future air quality analysis will include any refinements in methodologies, additional requirements in the State Implementation Plan, improved data on changing land use patterns evolving from the development of local comprehensive plans, and better definition of projects based on actual funding.

An air quality analysis of the NSC Preferred Alternative was conducted to ensure that construction of the facility would not be detrimental to the achievement of air quality standards. The methodology used to evaluate CO conformity for the NSC was developed in consultation with EPA, FHWA, and SRTC. The methodology developed provides a

project-level conformity determination, commonly referred to as a "Hotspot Analysis," in which potential carbon monoxide (CO) hotspots, as affected by the construction of the NSC, would be identified in 2020. The air quality impacts from CO emissions of motor vehicles at intersections must not exceed the NAAQS for localized CO concentrations. The NAAQS CO standard is 9 parts per million (9ppm) when averaged over an eight hour period, and 35 ppm for a one hour average. The identified locations were then subjected to the EPA-approved CAL3QHC model, to determine if any new exceedance of the NAAQS was occurring, or if an existing exceedance was being exacerbated. For potential hotspot locations identified in 2020, a 2010 analysis was also conducted, provided the portion of the NSC associated with that location was open in 2010.

The screening and ranking of intersections by 2020 total intersection approach volume resulted in a hotspot air quality analysis being conducted for the following three locations:
(1) Francis Ave./Market St.,(2) US2/SR206, and (3) Wellesley Ave./Market St.
All three locations are existing intersections which experience significant traffic impacts as a result of construction of the NSC. Therefore, air quality analysis for each location was done for 1999, 2010, and 2020.

In addition to ranking intersections by approach volume, they were also ranked by 2020 level of service (LOS). The three intersections exhibiting the poorest LOS were:
(1) US2/SR206, (2) Illinois Ave./Market St., and (3) Francis Ave./Market St.

Impacts

The following table presents the results of air quality modeling for the three heaviest volume intersections. CAL3QHC analysis indicates that none of the locations exceeds the NAAQS threshold in the forecast years of 2010 and 2020 for either build or no-build conditions. The analysis shows that the Francis Ave./Market St. intersection exceeds the 9 ppm standard in the base year (1999). The 2010 and 2020 analyses for that location demonstrate that the construction of the NSC does not exacerbate the modeled exceedance of the NAAQS at that location. Therefore, this project conforms to the SIP.

Table 4.1 Modeled Carbon Monoxide Levels, 1999, 2010, 2020

	CO Concentrations (ppm)			
	1999	2010	2020	
LOCATION	Base	Build	Build	No-Build
Francis Ave./Market St.	9.80	6.09	5.18	5.60
US 2/SR 206	7.49	6.58	6.37	5.95
Wellesley Ave./Market St.	6.93	4.83	5.11	4.83

In response to concern expressed by the Garden City area community regarding the specific air quality impact to Farwell Elementary and Northwood Middle School, WSDOT Air Quality specialists performed an additional, site-specific analysis. The CO

emissions were modeled at the school sites, at the outdoor recreation area closest to US 2, which would give the worst case scenario. The results are listed below, and show CO values well below the NAAQS threshold.

Table 4.2

Location	One Hour Average (ppm)	Eight Hour Average (ppm)
1	4.9	3.4
2	4.5	3.2

Mitigation

No air quality impact mitigation is required or proposed. There is no change from the FEIS, p. 4-13.

Noise

This section of the SEIS updates information contained in the North Spokane Freeway Final EIS for the FEIS Alignment and summarizes the supplemental noise impact analysis for the Preferred Alternative. Background information on the nature and measurement of noise, local noise regulations and ordinances, and the method of analysis are unchanged from the FEIS (pages 4-13 through 4-15).

Impacts

A revised noise impact analysis has been prepared for this SEIS, reflecting alignment changes in the FEIS corridor and new or different impacts resulting from the Preferred Alternative. A traffic noise impact occurs when a predicted traffic noise level approaches or exceeds the noise abatement criteria (67 dBA for residences, schools, churches, recreations areas, playgrounds, parks, motels, hotels, libraries, and hospitals), or when the predicted traffic noise level substantially exceeds the existing noise level. As defined by WSDOT, a noise level within 1 dBA of the noise abatement criteria (NAC) is considered to approach the NAC, and a 10 dBA increase over existing noise levels is considered a substantial increase.

FEIS Alignment, updated:

The noise impact analysis for the FEIS Alignment contained in the 1997 FEIS was based on 1993 traffic volumes provided by the Spokane Regional Transportation Council. Since publication of the 1997 FEIS, traffic volumes throughout the transportation corridor have been updated by WSDOT to reflect 1999 conditions. Noise impacts reported in the 1997 FEIS were updated by comparing 1993 volumes to 1999 volumes and determining the sound level increase resulting from the increased traffic volumes.

As noted in the introductory text of the 1997 FEIS, a doubling of traffic volumes results in a 3 dBA increase in sound levels, which is generally considered the limit at which sound level differences are discernible to average individuals.

Traffic volumes (p.m. peak) used in the modeling analysis for the 1997 FEIS ranged from approximately 10,000 vehicles (both directions) in the south end of the alignment to approximately 2,400 vehicles in the north end of the alignment near US 395 at Wandermere. Based on updated traffic volumes provided by SRTC, between 1993 and 1999, traffic volumes increased by 5% to 22%, depending on location within the alignment corridor. Sound level changes resulting from such increases in traffic volumes would range from less than 1 dBA to approximately 1.4 dBA and would not be detectable. As a result, the impact analysis for the FEIS Alignment discussed in the 1997 FEIS would remain essentially unchanged. Between the Spokane River and US 395 at Wandermere, the FEIS Alignment would result in approximately 220 impacts; 210 from noise levels that approach or exceed the Noise Abatement Criteria, and 10 from noise levels that would substantially increase over existing conditions.

Preferred Alternative:

The focus of the impact analysis is on the design year 2020 when the entire project would be completed. Under this approach, noise abatement measures, if needed, can be justified based on the conditions that would occur with completion of the entire project.

To determine if predicted noise levels associated with the project would result in a substantial increase, both modeled noise levels and noise monitoring results (short- and long-term) are used to characterize existing noise levels throughout the project corridor. For example, along Market Street from the Spokane River to near the vicinity of Francis Avenue, much of the area adjacent to the proposed alignment is urbanized and existing noise levels are generally higher than 56 dBA and there are few impacts attributed to substantial increases. However, north of Francis Avenue the alignment shifts to the east, away from Market Street into areas of less development and less urbanization. In these portions of the alignment more residents are identified as impacted by a substantial increase in noise levels.

Table 4.3 summarizes the results of the noise impact analysis for the Preferred Alternative. The analysis covers individual segments within the alignment, the type of roadway, and the distance to the 67-dBA impact limits for both sides of the roadway. **Table 4.3** also summarizes the number of residences impacted by either predicted traffic noise levels approaching or exceeding the noise abatement criteria, or by a substantial increase in traffic noise resulting from the proposed project.

The Preferred Alternative would result in a total of approximately 286 impacts; 234 from noise levels that approach or exceed the 67-dBA noise abatement criteria and 52 from noise levels that increase substantially over existing conditions.

Table 4.3 Summary of Noise Analysis Results for Design Year (2020)

Freeway Segment	Roadway Type	Distance to 67-dBA L_{eq} Contour Line Meters (Feet)[1, 2]		Impacted Residences (West/East)		
		West	East	AOE[3]	SI[4]	Total
1. Spokane River to Grace St.	Elevated Viaduct	107 (350)	91 (300)	78/35	0/0	113
2. Grace Street to Wellesley Ave. I/C	Depressed	95 (310)	95 (310)	0/39	0/0	39
3. Wellesley Ave. I/C to Columbia Ave.	Depressed	76 (250)	76 (250)	0	0/0	0
4. Columbia Ave. to Freya St.	Elevated Fill	183 (600)	183 (600)	0/6	0/3	9
5. Freya St. to Parksmith Dr.	Elevated Fill	149 (490)	162 (530)	13/19	0/10	42
6. Parksmith Dr. to Mead Royale Mobile Home Park	Elevated Fill	137 (450)	137 (450)	0/34	0/28	62
7. Mead Royale Mobile Home Park to Farwell Rd.	Depressed	40 (130)	40 (130)	0/0	0/0	0
8. Farwell Rd. to Perry St.	Depressed	76 (250)	76 (250)	3 (north) 7 (south)	5 (north) 6 (south)	21
9. Perry St. to US 395 at Wandermere	Elevated Fill	122 (400)	122 (400)	0/0	0/0	0
TOTAL						286

Notes:
1. All distances are measured from centerline of the roadway.
2. Effects of local shielding included where appropriate.
3. Approach or Exceed 67-dBA L_{eq}.
4. Significant Increase; 10 dBA increase over existing conditions.

Mitigation

Noise Abatement Criteria. The following is a discussion of methods to abate operational traffic noise impacts. According to the Code of Federal Regulation (23 CFR Chapter 1, Part 772), the following noise abatement measures may be incorporated into this project to reduce traffic noise impacts:

- Traffic management measures
- Alteration of horizontal and vertical alignments
- Construction of noise barriers
- Acquisition of real property or interests therein to serve as a buffer zone to preempt development which would be adversely impacted by traffic
- Noise insulation of public use or nonprofit institutional structures

This section focuses on the consideration of noise barriers as a primary means of abating project-related noise impacts. A number of factors go into the determination of whether noise abatement measures are reasonable and feasible including:

- Noise abatement benefits
- Cost of abatement
- Views of impacted residents
- Absolute sound levels
- Changes in noise levels
- Development along the highway
- Environmental effects of abatement construction

Feasibility. For a noise barrier to be considered feasible, it must be constructable and provide a minimum of 5 dBA reduction for the first row of receivers with at least one receiver having a 7 dBA reduction (reasonable efforts must also be made to attain a 10 dBA or greater reduction in sound levels at the first row of receivers).

Reasonableness. Once the construction of a noise barrier has been determined feasible, WSDOT will then determine whether construction of the barrier is reasonable by thoroughly considering a wide range of criteria such as:

- whether noise levels in the design year approach or exceed the applicable noise abatement criteria or qualify as a substantial (10 dBA) exceedance over existing levels
- determining if a majority of the first row of receivers obtain a minimum 5 dBA benefit from the sound wall with at least one receiver attaining a 7 decibel reduction
- determining if the noise mitigation cost per residence is at or less than that indicated in **Table 4.4**. This is determined by counting all residences benefited by the noise barrier and dividing that number into the total cost of the noise abatement measure.
- determining the most suitable material for construction of noise barriers (including the type of material to be used for construction of the barrier) after final horizontal and vertical alignments are determined and a detailed engineering analysis of the feasibility and reasonability of noise abatement measures can be made.

Table 4.4 Allowance for Impacts Caused by Total Traffic Noise Level

Design Year Traffic Noise Decibel Level	Allowed Cost Per Household ($)[1]	Equivalent Wall Surface Area Per Household - Square Meters (Square Feet)
66 dBA	15,500	65.0 (700)
67 dBA	17,000	71.5 (770)
68 dBA	18,500	77.7 (837)
69 dBA	20,000	84.0 (905)
70 dBA	21,500	90.5 (973)
71 dBA	23,000	96.7 (104)
72 dBA	24,500	103.0 (1,109)
73 dBA	26,000	109.2 (1176)
74 dBA	27,500	115.5 (1,244)

[1] Reevaluated in January of each year. Based on $22.1 per square foot constructed cost of a concrete wall. Source: Washington State Department of Transportation 1999.

It is WSDOT's policy to make final decisions on the construction of noise barriers after final horizontal and vertical alignments are determined and a detailed engineering analysis of the feasibility and reasonability of noise abatement can be made.

Noise Abatement for the NSC Preferred Alternative. This section summarizes the noise abatement analysis for all areas potentially impacted by project-related noise. For each segment of the proposed freeway, noise barriers were evaluated for various heights between 3 meters (10 feet) and 5 meters (16 feet). Within each segment, each barrier height was evaluated against WSDOT's feasibility criteria to determine if it provided the minimum 5 dBA benefit with at least one receiver attaining a 7 dBA reduction. For those barrier heights that met the WSDOT feasibility criteria, a reasonableness determination was then made based on the estimated cost of the sound wall using cost criteria provided by WSDOT and the number of benefiting residences (the number of residences within 152 meters (500 feet) of the right-of-way receiving at least a 3 dBA reduction in noise levels as a result of the barrier). If a sound wall was determined to be both feasible and reasonable, then additional barrier heights were evaluated up to a maximum height of 5 meters (16 feet) to determine if a 10 dBA insertion loss could be attained at the first row of receivers.

Table 4.5 summarizes noise abatement measures for the proposed project. The number of residences receiving beneficial noise reduction from a concrete sound wall is listed for each segment. The cost per residence receiving benefit is then calculated and shown

using cost criteria provided by WSDOT. It is possible that equivalent noise reduction could be attained using less expensive materials than those used in the following estimates. Such cost considerations would be evaluated by WSDOT at the time of final project design. All noise abatement measures under consideration were evaluated to reduce to the extent possible all impacts in the respective areas (i.e., within 152 meters [500 feet] of the right-of-way). **Table 4.5** shows the number of impacted residences remaining after abatement is provided by concrete sound walls which meet both the WSDOT criteria for feasibility and reasonableness.

Although the estimated cost and benefit of the noise abatement measure is shown in **Table 4.5** and discussed below, other factors would be considered by WSDOT before recommending specific abatement measures. For example, public opinion may greatly affect the final decision on whether to construct a particular abatement measure.

Segment 1: Spokane River to Grace Street

On the east side of the alignment from the Spokane River to Grace Street, 3-, 3.7-, and 4.3-meter (10-, 12-, and 14-foot, respectively) sound barriers extending approximately 500 meters (1,640 feet) from the river to the vicinity of Grace Street would meet the WSDOT feasibility and reasonableness criteria. All residences within 152 meters (500 feet) of the right-of-way would benefit from a sound wall (i.e., receive at least a 3 dBA noise reduction from the barrier). Approximately 71 residences on the east side of the alignment would benefit from a noise barrier in this segment. Extending the height of the barrier to 4.3 meters (14 feet) would achieve the additional benefit of attaining a 10 dBA reduction in sound levels at the first row of receivers. No impacted residences would remain after implementation of this abatement measure.

On the west side of the alignment, 3-, 3.7-, and 4.3-meter (10-, 12-, and 14-foot, respectively) sound barriers approximately 550 meters (1,800 feet) long would meet the WSDOT feasibility and reasonableness criteria. Approximately 100 single- and multi-family residences (including all residences within 152 meters [500 feet] of the right-of-way) between the Spokane River and the point where the alignment enters a below-ground depression would benefit from a sound barrier on the west side of the alignment in this section. As described for the east side of the alignment, extending the height of the barrier to 4.3 meters (14 feet) would achieve a 10 dBA reduction in sound levels at the first row of residences on the west side of the alignment. There would be no impacted residences remaining after implementation of this abatement measure.

Segment 2: Grace Street to Wellesley Avenue Interchange

On the east side of the alignment from the beginning of the depression near Grace Street, 3-, 3.7-, 4.3-, and 4.9-meter (10-, 12-, 14-, and 16-foot, respectively) sound barriers extending approximately 671 meters (2,200 feet) into the undeveloped open space north of the JJ Hill Park would all meet the WSDOT feasibility and reasonableness criteria; however, none would provide a 10 dBA reduction at the first row of residential receivers.

A 4.9-meter (16-foot) barrier would provide a nearly 9 dBA benefit at the first row of residential receptors. All residents within 152 meters (500 feet) of the right-of-way would receive at least a 3 dBA benefit from any of the sound barriers evaluated. Approximately 141 residences between Grace Street and JJ Hill Park would benefit from a sound wall on the east side of the alignment. After abatement, approximately 4 single-family residences would remain impacted if the sound wall were constructed to a height of 3 or 3.7 meters (10 or 12 feet). Extending the height of the sound wall to 4.3 meters (14 feet) would abate impacts at all residential locations.

On the west side of the alignment 3-, 3.7-, 4.3-, and 4.9-meter (10-, 12-, 14-, and 16-foot, respectively) sound barriers do not meet the WSDOT feasibility criteria of providing a 5 dBA benefit at the first row of receivers. Also, the nearest residences on the west side of the alignment in this segment are more than 152 meters (500 feet) from the center line of the proposed roadway. At this distance, a sound barrier would provide very little acoustic benefit.

Segment 3: Wellesley Avenue Interchange to Columbia Avenue

On the east side of the alignment in this segment there is approximately 305 meters (1,000 feet) of open space between the alignment and approximately 20 scattered residences along Ferrall Street between Broad Avenue and Rowan Avenue. At this distance, 3-, 3.7-, 4.3-, and 4.9-meter (10-, 12-, 14-, and 16-foot, respectively) sound barriers do not meet WSDOT feasibility or reasonableness criteria because of the limited number of residences.

On the west side of the alignment there are approximately 4 single-family residences west of Market Street within 152 meters (500 feet) of the right-of-way. Due to the high existing background sound levels near Market Street, shielding provided by commercial establishments on the east side of Market Street, and the small number of residences, a sound wall on the west side of the alignment in this segment would not meet WSDOT feasibility criteria.

Segment 4: Columbia Avenue to Freya Street

On the east side of the alignment there are approximately 10 single-family residences within 152 meters (500 feet) of the right-of-way. Nearly all of these residences are located north of Lyons Avenue and east of Freya Street. A 4.3-meter (14-foot) sound wall approximately 427 meters (1,400 feet) long would meet the WSDOT feasibility criteria, but would not meet the reasonableness criteria because of the small number of residences benefited by the barrier.

Because sound walls do not meet the reasonableness criteria in this segment of the alignment, approximately 9 residences would remain impacted after construction of the project **(Table 4.5)**.

Segment 5: Freya Street to Parksmith Drive

Between Freya Street and Lincoln Road the roadway is proposed to be elevated on fill. On the east side of the alignment between Freya Street and Lincoln Road a 1,037-meter (3,400-foot) sound barrier 3 meters (10 feet) high would not meet WSDOT's feasibility criteria. A sound barrier 3.7 meters (12 feet) high would meet the feasibility requirements, but because of the limited number of benefiting residences (approximately 26), it would not meet WSDOT's reasonableness criteria.

On the west side of the alignment an 854-meter (2,800-foot) sound wall 3 and 3.7 meters (10 and 12 feet, respectively) high would not meet WSDOT's feasibility criteria. A sound wall 4.3 meters (14 feet) high would meet the feasibility requirements, but because of the limited number of benefiting residences (approximately 12), this barrier would not meet WSDOT's reasonableness criteria.

Because a sound wall for this segment of the alignment does not meet the feasibility and reasonableness criteria, an earth berm located within the right-of-way was considered for this segment. As noted above, the alignment between Freya Street and Lincoln Road would be located on fill approximately 4.6 meters (15 feet) to 7.6 meters (25 feet) above ground level. According to plan view aerial photographs of the alignment, the available right-of-way in this segment varies from 12.2 meters (40 feet) at Wilding Avenue to a maximum of 22.9 meters (75 feet) at Lincoln Road. Assuming a 2:1 slope for an earth berm, up to 42.6 meters (140 feet) of right-of-way would be required to construct an earth berm 10.7 meters (35 feet) high. As presently designed there is not enough right-of-way available to construct an earth berm of sufficient height to provide acoustic benefits to nearby residents.

Because sound walls are not feasible or reasonable in this segment of the alignment, approximately 42 residences would remain impacted after construction of the project (**Table 4.5**).

Segment 6: Parksmith Drive to Mead Royale Mobile Home Park

On the east side of the alignment all sound barriers from 3 meters (10 feet) to 4.9 meters (16 feet) in height extending approximately 854 meters (2,800 feet) parallel to the west side of the mobile home park would meet WSDOT's feasibility and reasonableness criteria. However, none of the barriers would provide a 10 dBA benefit at the first row of receivers inside the mobile home park. Approximately 70 residences in the mobile home park would benefit from construction of a sound barrier on the east side of the alignment.

Construction of 3- or 3.7-meter (10- or 12-foot) sound walls would abate approximately 27 residential impacts, leaving approximately 35 residences impacted after construction of the project. If 4.3- or 4.9-meter (14- or 16-foot) sound walls were constructed, approximately 23 residences would remain impacted after construction of the project.

Sound walls on the west side of the alignment are not warranted because the area west of the alignment is undeveloped with no residential receivers.

Segment 7: Mead Royale Mobile Home Park to Farwell Road

From the Mead Royale Mobile Home Park north to Farwell Road, there is undeveloped open space on both sides of the alignment. No sound barriers in this segment are warranted because there are no residential receivers within 152 meters (500 feet) of the alignment.

Segment 8: Farwell Road to Perry Street

After crossing Farwell Road the alignment turns west and enters relatively undeveloped open space west of Shady Slope Road and south of Winger Street. Due to the sloping topography, this segment is approximately 3 meters (10 feet) below existing ground level on the north side, but approximately at existing grade on the south side of the NSC.

On the north side of the alignment a 457-meter (1,500-foot) sound barrier 3 meters (10 feet) or 3.7 meters (12 feet) high would not meet WSDOT's feasibility criteria. A sound wall 4.3 meters (14 feet) high would meet the feasibility requirements, but because of the limited number of benefiting residences (approximately 9), the barrier would not meet WSDOT's reasonableness criteria.

On the south side of the alignment a 488-meter (1,600-foot) sound wall 3 meters (10 feet) or 3.7 meters (12 feet) high would not meet WSDOT's feasibility criteria. A sound barrier 4.3 meters (14 feet) high would meet WSDOT's feasibility requirements, but because of the limited number of benefiting residences (approximately 8), the barrier would not meet reasonableness criteria.

Segment 9: Perry Street to US 395 at Wandermere

Beyond Perry Street the alignment enters undeveloped open space. Sound barriers would not be warranted in this section because of the lack of residential receivers.

IMPACTS REMAINING AFTER CONSIDERATION OF NOISE ABATEMENT

Based on the noise impact analysis for the Preferred Alternative, approximately 268 residences would be impacted by the proposed project prior to consideration of noise abatement measures. According to WSDOT criteria, sound walls in the following segments of the alignment are both feasible and reasonable:

- Segment 1 (east and west): Spokane River to Grace Street
- Segment 2 (east): Grace Street to Wellesley Avenue I/C
- Segment 6 (east): Parksmith Drive to Mead Royale Mobile Home Park

Approximately 382 residences would benefit (i.e., receive at least a 3 dBA reduction in estimated sound levels) from construction of sound walls in these segments of the proposed alignment. After providing the minimum abatement - building sound walls only in those segments where they were found to be both feasible and reasonable - approximately 95 residences would remain impacted after completion of the proposed project. Mitigation beyond this is possible, and is being investigated. Final determination of noise abatement is not made until after the Design and Access Hearing. WSDOT has committed to evaluate the possibility of mitigative effort beyond that required by noise abatement criteria (FEIS, p. S-xxx). Where sufficient right-of-way is available, such as in Segment 8 (Farwell Road to Perry Street), an earthen berm is an option. The lower cost of a berm built with material from excavation compared to a concrete wall is likely to make this option reasonable. In Segments 4 and 5, where additional right-of-way is not available, other types of wall construction will be evaluated in the effort to provide some level of noise abatement. If all noise impacts could be abated in these segments, the remaining unmitigatable noise impacts overall could be reduced to approximately 42.

Table 4.5 Summary of Noise Mitigation for North Spokane Corridor

Segment	Side of Road	Proposed Wall Meters (Feet) Height	Length	Est. Cost ($1,000)	Benefiting Residences	Cost per Residence ($)	Mitigation Feasible?	10-dBA Insertion Loss?	Mitigation Reasonable? (see note)	AOE or SI * after Abatement?
1	East	3.0 (10)	500 (1,640)	362	71	5,100	Yes	No	Yes	0
		3.7 (12)	500 (1,640)	435	71	6,100	Yes	No	Yes	0
		4.3 (14)	500 (1,640)	507	71	7,100	Yes	Yes	Yes	0
	West	3.0 (10)	550 (1,800)	398	100	4,000	Yes	No	Yes	0
		3.7 (12)	550 (1,800)	477	100	4,700	Yes	No	Yes	0
		4.3 (14)	550 (1,800)	557	100	5,600	Yes	Yes	Yes	0
2	East	3.0 (10)	671 (2,200)	486	141	3,450	Yes	No	Yes	4
		3.7 (12)	671 (2,200)	583	141	4,138	Yes	No	Yes	4
		4.3 (14)	671 (2,200)	681	141	4,800	Yes	No	Yes	0
		4.9 (16)	671 (2,200)	778	141	5,500	Yes	No	Yes	0
	West	Sound walls on west side of alignment not feasible or reasonable because of limited number of residences receiving benefit (approximately 21).								
3	Sound walls on east and west side of alignment not feasible or reasonable because of distance to nearest residences and small number of benefited residences.									
4	East	3.0 (10)	427 (1,400)	309	10	31,000	No	No	No	9
		3.7 (12)	427 (1,400)	371	10	37,000	No	No	No	9
		4.3 (14)	427 (1,400)	433	10	43,000	Yes	No	No	9
	West	Sound wall on west side of alignment is not feasible or reasonable because of limited benefiting residences (approximately 4) located more than 500 feet from proposed right-of-way.								
5	East	3.0 (10)	1,037 (3,400)	751	26	28,900	No	No	No	29
		3.7 (12)	1,037 (3,400)	902	26	35,000	Yes	No	No	29
	West	3.0 (10)	854 (2,800)	619	12	51,500	No	No	No	13
		3.7 (12)	854 (2,800)	743	12	61,900	No	No	No	13
		4.3 (14)	854 (2,800)	866	12	72,200	Yes	No	No	13

Seg-ment	Side of Road	Proposed Wall Meters (Feet) Height	Length	Est. Cost ($1,000)	Benefiting Residences	Cost per Residence ($)	Mitigation Feasible?	10-dBA Insertion Loss?	Mitigation Reasonable? (see note)	AOE or SI * after Abatement?
6	East	3.0 (10)	854 (2,800)	619	70	8,840	Yes	No	Yes	35 (SI)
		3.7 (12)	854 (2,800)	743	70	10,600	Yes	No	Yes	35 (SI)
		4.3 (14)	854 (2,800)	866	70	12,375	Yes	No	Yes	23 (SI)
		4.9 (16)	854 (2,800)	990	70	14,000	Yes	No	Yes	23 (SI)
	West	Sound wall on west side of alignment not warranted because of open space west of the alignment.								
7	No sound walls warranted because of open space/undeveloped land on both sides of the alignment.									
8	North	3.0 (10)	457 (1,500)	332	9	36,800	No	No	No	8
		3.7 (12)	457 (1,500)	398	9	44,200	No	No	No	8
		4.3 (14)	457 (1,500)	464	9	51,500	Yes	No	No	8
	South	3.0 (10)	488 (1,600)	354	8	44,200	No	No	No	13
		3.7 (12)	488 (1,600)	424	8	53,000	No	No	No	13
		4.3 (14)	488 (1,600)	495	8	62,000	Yes	No	No	13

Note: It is possible that equivalent noise reduction cold be attained using less expensive materials then those used in the cost estimates. Such cost considerations and material specifications would be evaluated by WSDOT at the time of final project design..

Energy

The FEIS compared the energy consumption and supply conditions and impacts of all build alternatives to the no-build alternative, mass transit, nonstructural measures, and improvements to existing facilities (FEIS, p. 4-34 through 4-35).

Impacts

The FEIS showed that any build alternative consumed less energy in operation than the No-Build Alternative. The congestion on existing north-south arterials is the main factor in the purpose and need for the NSC. With the current types of engines in vehicles, congestion directly translates into higher fuel consumption and higher air pollution emissions. With the current models and assumptions used to make projections, added capacity reduces congestion.

Mitigation

The proposed mitigation for energy impacts is unchanged from the FEIS, p. 4-35.

Geology and Soils

Impacts

The Preferred Alternative between Lincoln Road and Hawthorne Road is located further east of the FEIS Alignment. In this location, the Preferred Alternative cuts further into Geologically Hazardous Critical Areas as identified by Spokane County than does the FEIS Alignment. These west-facing slopes are composed of Latah Formation soils. The revised alignment in this area is due to the need to avoid the TOSCO Superfund Site near Francis Avenue and a cultural site near Gerlach Road (see Cultural Resources, this chapter).

The Preferred Alternative also crosses a landfill just south of Hawthorne Road. This site was investigated for contamination due to the historical usage, but it was not found to be a hazardous site. The excavations did reveal large quantities of woody debris that will not be suitable base material for road building and will require excavation. Estimates are for the relocation of 123,093 m^3 (161,000 yd^3) of debris. The disposition of this material will be determined by reaching an agreement with the Washington State Department of Ecology to relocate and encapsulate the debris to another portion of the same parcel, outside of the NSC right-of-way. Should an agreement not be reached, this site may be considered a dump site and the excavated materials will require special disposal.

Between Hawthorne Road and US 395 at Wandermere, the Preferred Alternative involves the same soil types as the FEIS Alignment, but differs in topography. **(See Geology and Soils Map, Figure 3.1.)** In addition, both alternatives encounter erodible soils, which are designated as Geologically Hazardous by the Spokane County Critical Areas Ordinance, along Deadman Creek at the US 2 interchange. The Preferred Alternative also involves

up to 9m (30 ft) vertical cut sections as compared to the FEIS Alignment, which was proposed to be constructed on approximately 9m (30 ft) vertical fill in this area. Based on water well records indicating the depth of the water table, these cuts are not expected to encounter or impact the water table.

Mitigation

A geotechnical investigation is conducted on all projects that involve significant grading quantities, unstable ground, or foundations for structures in a manner that preserves the safety of the public who use the facility, as well as preserving the economic investment by the state of Washington.

Geotechnical data necessary to allow completion of the investigation is compiled during the design phase. This includes soils borings, testing, and final geometric data. Detailed design of cut and fill slopes can be done once the roadway geometry is established and geotechnical data is available. The purpose of this design effort is to determine the maximum stable cut or fill slope and, for fills, potential for short and long term settlement. Recommendations resulting from the Geotechnical Report will direct slope and roadway construction techniques to minimize erosion and to protect public health, safety, and property.

Waterways and Hydrological Systems

Impacts

The impacts of the proposed revised alignment in terms of waterways or hydrological systems are unchanged from the FEIS. Both the FEIS Alignment and the Preferred Alternative are within the Aquifer Protection Area. Hydrological features and impacts are described in the FEIS (pages 4-50 through 4-53) with the following addition. Both alignment alternatives include widening US 2 at the crossing of Deadman Creek**.** More information is available on impacts of the Preferred Alternative since design has proceeded on this alignment. The proposed widening, on either side of US 2, will include the building of retaining walls and fill on the existing slope. Construction will not impact the creek or creek banks, other than the removal of trees.
See Waterways and Hydrological Systems Map, **Figure 3.3**.

Mitigation

No mitigation is required or proposed. There is no change from the FEIS, p. 4-53.

Flood Plains

Impacts

The flood plain impacts of the FEIS Alignment remain as described in the FEIS, p. 4-55 through 4-59, with the following addition. Both the FEIS Alignment and the Preferred Alternative are adjacent to the Deadman Creek flood plain. The Preferred Alternative does not further encroach on the flood plain. **See Flood Plain and Shorelines Map, Figure 3.4.**

Mitigation

Mitigation is not changed from the FEIS, p. 4-59, except that construction work within the Deadman Creek flood plain will require permit approval from Spokane County. In order to obtain the required County Flood Plain Permit, WSDOT will need to show that there is no greater than one foot increase in base flood elevation, or have obtained an easement to allow inundation of the increased flood plain.

Water Quality

Impacts

Water Quality impacts are not changed from the FEIS, p. 4-61 through 4-68. Stormwater management will be fully detailed in the Hydraulic Report, which will be in conformance with WSDOT's Highway Runoff Manual and Hydraulic Manual. Area of Influence Studies would be necessary if infiltration ponds are to be used for stormwater management near Federal Superfund Sites and other contaminated areas along the corridor. At this time, evaporation ponds are proposed.

Mitigation

The mitigation for possible water quality impacts is unchanged from the FEIS, p. 4-68.

Shorelines

Impacts

The impacts in terms of shorelines are as described in the FEIS, p. 4-93, with the following addition. Both the FEIS Alignment and the Preferred Alternative have the additional impact of involving road construction within the setback of the state shoreline of Deadman Creek. Deadman Creek is designated "Pastoral" in the Spokane County Shoreline Master Plan. Road construction is prohibited within 61m (200 ft) of the shoreline of this stream. A Substantial Development Permit will be required, which typically involves a three month process. Any construction work within the stream requires a Hydraulic Permit from Washington State Department of Fish and Wildlife. The present design does not necessitate lengthening of the existing culvert or widening of the existing fill. The impacts to Deadman Creek are also subject to the County Critical Areas Ordinance as a shoreline of the state, riparian habitat, and wetland. The present design does not propose construction beyond toe of the slope of the existing highway.

In the event that design changes result in impacts to the shoreline, additional fill and lengthening of the culvert, and involve work within the stream, the appropriate documentation, permitting, and mitigation of impacts will be performed.
See Flood Plain and Shorelines Map, Figure 3.4.

Mitigation
No mitigation is anticipated beyond compliance with Shorelines permit.

Wetlands

Impacts

The impacts to wetlands are as described in the FEIS, p. 4-76 through 4-77, with the following addition. Three additional wetlands have been identified within the proposed right-of-way for both the FEIS Alignment and the Preferred Alternative. The first two are a result of two independent springs in the Wandermere area. They are not hydrologically connected to each other. Due to the distance from these wetlands, the Preferred Alternative will not influence the hydrology or measurably affect the development or continued existence of these wetland.

1. An approximately 0.2 hectare (.5 acre) wetland adjacent to US 395 on the east side is described as Palustrine, Forested, Broad-leaved Deciduous, Permanently Flooded wetland (PFO1H). This wetland is a Category II wetland as defined by the Washington Department of Ecology Rating System for Eastern Washington. This wetland is associated with a Type 5 stream as defined by the Spokane County Critical Areas Ordinance. The buffer for this type of stream is 7.62 meters (25 feet), which is within the 45.72- meter (150-foot) buffer required for a Category II wetland. This project will avoid this area by at least 60.96 meters (200 feet). The wetland will not be affected by this project.
2. An approximately 0.2 hectare (0.5 acre) wetland adjacent to Wandermere Road is described as Palustrine, Emergent, Persistent, Permanently Flooded wetland (PEM1H). This wetland is a Category III wetland as defined by the Washington Department of Ecology Rating System for Eastern Washington. This wetland has developed since the construction of the present Wandermere Road in 1993. It is isolated from other wetlands or riparian areas, and is not connected by surface waters at any time during the year. Work will occur outside the 22.86-meter (75-foot) buffer for this type of wetland. Both #1 and #2 wetlands will receive full protection during construction of the new facility.
3. An approximately 4.5 hectare (10 acre) wetland is associated with Deadman Creek where US 2 crosses at MP 296.5. It is described as Palustrine, Scrub-Shrub, Broad-leaved Deciduous, Seasonally Flooded wetland (PSS1C). This wetland is a Category II wetland as defined by the Washington Department of Ecology Rating System for Eastern Washington. No impacts to this wetland are expected with the proposed design.

All three of these wetland areas have been investigated several times during the growing season for Ute ladies'-tresses (*Spiranthes diluvialis*) and Water Howellia (*Howellia aquartilis*). These species have not been found in or near any of these wetlands. Habitat for either species is lacking or marginal at best in these wetlands. Wetland investigation has determined that the Preferred Alternative will not influence the hydrology, nor measurably affect the development or continued existence of these wetlands. Any construction impacting the Deadman Creek wetland would require a permit from the

Army Corps of Engineers and the Washington State Department of Ecology. Construction will be designed to avoid impact to all of these wetlands with the following measures taken:

- Storm water discharge to surface water bodies will be avoided by the use of propertly maintained, permanent water quality/quantity treatment BMPs.
- Permanent erosion and sediment control measures will be maintained to ensure that wetland filling and river/creek sediment contamination do not occur.

See Wetlands Map, Figure 3.6.

Mitigation

No mitigation is required or proposed. The most current and appropriate BMPs will be detailed in the Stormwater Site Plan (SSP). The SSP includes the hydraulic report, Temporary Erosion and Sediment Control Plan, BMP selection, and the project-specific maintenance schedule. This plan is then included in the Plans, Specifications, and Estimates (PS&E) for construction. This process and the catalog of BMPs are found in the WSDOT Highway Runoff Manual.

Wildlife, Fisheries, and Vegetation

Impacts

Between the Spokane River and Hawthorne Road, the wildlife, fisheries, and vegetation impacts are unchanged from FEIS (pages 4-82 through 4-83).

An updated Biological Assessment has been completed for the area between Hawthorne Road and US 395 at Wandermere within the Preferred Alternative. The finding of the Biological Assessment is that the Preferred Alternative passes through more forested undeveloped and suburban land than the FEIS Alignment, and therefore will have higher impact on the wildlife presently occupying this portion of Spokane County by reducing available habitat. Threatened and Endangered Species information will be updated within six months of the beginning of construction.

Mitigation

No mitigation is required or proposed. The portion of the County impacted by the proposed Preferred Alternative is within the IUGA, and other than the Deadman Creek Critical Area, is slated for urban growth. The proposed roadway will be designed to avoid impact to the Deadman Creek shorelines, riparian habitat, and associated wetlands.

Social/Economic Impacts

Land Use

Impacts

The estimated amount of land required for the Preferred Alternative compared to the FEIS Alignment is updated in the table below. The area required to build the FEIS Alignment, however, is based on the information in the FEIS which was derived from limited design development. The required area determined for the Preferred Alternative reflects a more developed design and higher level of accuracy in right-of-way needs.

Table 4.6 Route Length and Area

Route	Length	Total Area
FEIS Alignment	13.3 km (8.3 miles)	244 hectares (602 acres)
Preferred Alternative	14.1 km (8.7 miles)	255 hectares (629 acres)

Zoning

The FEIS Alignment through the City of Spokane does not involve any different zones as compared with the Preferred Alternative, and is described in the FEIS. In Spokane County, both the FEIS Alignment and the Preferred Alternative pass through General Agriculture, Urban Residential allowing 1.4 units per hectare (3.5 units per acre) (UR 3.5), Heavy Industrial (I-3), and Mining (MZ) zones. Within the City limits, under the existing Comprehensive Plan, the majority of the land impacted is designated Industrial. The following table presents the comparison of land area by zoning for alternative alignments using the most recent zoning available. **(See Zoning Map, Figure 3.8.)**

Table 4.7 Land Use by Zoning Category, Spokane River to US 395 at Wandermere

Route	Zoning Category	City Area by Zone hectares (acres)	County Area by Zone hectares (acres)	Total Area hectares (acres)
FEIS Alignment	Residential	19.6 (48.4)	109.5 (270.5)	129.1 (319.0)
	Industrial	33.18 (81.99)	68.8 (169.9)	102.0 (251.9)
	Commercial	- -	1.4 (3.5)	1.4 (3.5)
	General Agriculture	- -	9.6 (23.7)	9.6 (23.7)
	Mining	- -	1.7 (4.1)	1.7 (4.1)
FEIS Alignment Total Acres		52.8 (130.4)	190.9 (471.8)	243.7 (602.2)
Preferred Alternative	Residential	4.8 (12.0)	120.9 (298.8)	125.8 (310.7)
	Industrial	43.6 (107.8)	39.5 (97.4)	83.0 (205.2)
	Commercial	6.8 (16.9)	1.9 (4.8)	8.8 (21.7)
	General Agriculture	- -	11.9 (29.5)	11.9 (29.5)
	Mining	- -	25.0 (61.7)	25.0 (61.7)
Preferred Alternative Total Acres		55.3 (136.7)	199.2 (492.2)	254.5 (628.9)

The FEIS Alignment passes through a rapidly growing residential area between US 2 and US 395 at Wandermere. This is an area with the highest concentration of residential building permits within the study area. These neighborhoods are adjacent to schools and expanding shopping areas. The County has also proposed an Urban Activity area around the Wandermere Mall under its "Focused Growth" scenario. (This scenario is one of three options for the basis of the County Comprehensive Plan.) Aerial and ground surveys, as well as county building permit data, show a high rate of development and proposed development in this location. The FEIS Alignment was also found to have heavy impacts on local business and industry.

In comparison to the FEIS Alignment, the proposed Preferred Alternative aligns closer to the edges of developing areas rather than bisecting them. It keeps the corridor closer to the northern edge of the IUGA, rather than cutting through the rapidly developing neighborhoods between US 395 and US 2. The revision allows this area within the IUGA to develop in a more cohesive manner. The proposed new alignment also avoids displacement or disruption to a majority of the businesses in the area.

Mitigation
No mitigation is required or proposed.

Industrial Land/ Businesses and Employment

From the Spokane River to Francis Avenue, the Preferred Alternative reduces the impact to industrial land and businesses as compared with the FEIS Alignment. The difference is due to the mainline shifting to the west and the redesign of the Wellesley Avenue and Francis Avenue interchanges. With the alignment shifted west and the major interchanges reconfigured, two large food warehouse and distributor businesses are avoided, and impact to a large asphalt manufacturing business is minimized with the Preferred Alternative.

Just north of Francis Avenue, the FEIS Alignment displaces a wood roof truss manufacturer, which is also new since the FEIS was published. The Preferred Alternative is shifted approximately 30.5m (100 ft) east in this area, and avoids displacement of this business.

From Francis Avenue to Hawthorne Road, the FEIS Alignment heavily impacts many of the businesses within industrially zoned land along North Market Street. This area is home to clusters of businesses which support each other, such as auto dismantling and used auto and truck part sales. Such businesses can be difficult to relocate, since they require large parcels of land within industrial zoning and where proximity to each other could be maintained. Also, these types of businesses tend to be objectionable to adjacent residents due to their visual, noise, dust, and odor characteristics. In this segment, the FEIS Alignment displaces five (5) of these types of businesses in addition to five (5) others on North Freya Street. The Preferred Alternative displaces only one (1) business in this area.

Between Hawthorne Road and US 395 at Wandermere, the FEIS Alignment with the Stoneman Road Interchange displaces a total of six (6) businesses, including two (2) home businesses and one (1) senior assisted living center in the vicinity of US 2 and Pittsburg Street. It has a minor impact to one wrecking yard business, and major impact to the Kaiser operation, taking approximately 52.6 hectares (130 acres) from the main plant parcel. The Preferred Alternative, with the Parksmith Drive interchange, displaces four (4) businesses, causes major disruption to one wrecking business, and has greatly reduced impact to Kaiser, taking approximately 5.7 hectares (14 acres). The FEIS Alignment bisects the Kaiser Aluminum Mead parcel on which the north plant is located, between Hawthorne Road and Farwell Road. The Preferred Alternative has greatly reduced impact on this parcel.

Direct Impact: Business Relocation

Table 4.8 Business and Employment Impacts

Alignment Alternative	Number of Businesses Displaced	Approximate Number of Employees Affected
FEIS Alignment, Spokane River to Hawthorne Road	34	725-764
FEIS Alignment, Hawthorne Road to US 395 at Wandermere	6	24-39
FEIS Alignment TOTAL	**40**	**749-803**
Preferred Alternative, Spokane River to Hawthorne Road	28	279-313
Preferred Alternative, Hawthorne Road to US 395 at Wandermere	7	51-59
Preferred Alternative TOTAL	**35**	**330-372**

See full Business and Employment Impact Estimate Tables, **Appendix C.**

Indirect Impact: Number of Businesses within 1000 ft of Right-of-Way

The number of businesses within an area extending 305m (1000 ft) on either side of the alignment right-of-way were counted using aerial photographs and field surveys. This count does not include the businesses located within the NSC right-of-way. This was the method used in the FEIS to determine the number of commercial properties likely to experience disruption as a result of the NSC. The number of businesses within 305m (1000 ft) of the FEIS Alignment and of the Preferred Alternative between the Spokane River and Hawthorne Road are not significantly different; approximately 100-105. There are 2 businesses within 305m (1000 ft) of the right-of-way of the Preferred Alternative, between Hawthorne Road and US 395 at Wandermere (Wandermere Golf Course, and Willow Grove Senior Care Home). There is only one business within 305m (1000 ft) of the FEIS Alignment right-of-way (Wandermere Golf Course).

Mitigation

The revisions to the FEIS Alignment were designed in part to avoid or minimize economic impact on businesses in the corridor. Kaiser Mead Aluminum plant is the largest employer in the study area. Kaiser Aluminum stated that any reduction of its property south of Farwell Road would jeopardize the plant's long-term viability. The

selection of the Preferred Alternative reduces impacts from displacement to disruption on other employers, including Food Services of America, the Koch Asphalt plant, as well as several smaller businesses. The highest concentration of business relocation is in the Hillyard area. Preliminary studies indicate that there is adequate vacant land within this business district with proper zoning for business relocations.

Residential Land

Between the Spokane River and Wellesley Avenue, the number of homes directly and indirectly impacted by the alternative alignments do not differ. Just north of the Spokane River on Greene Street, an apartment complex built in the spring of 1997 affects the impacts of both the alternative alignments. Spokane Neighborhood Action Program (SNAP) manages the 11-unit apartment complex, which was built with State Housing Trust Funds and Federal Home Funds. The apartments house families with household incomes less than 50% of the county median income. Both alignment alternatives cause the displacement of this apartment complex.

Between Wellesley Avenue and Francis Avenue, the Preferred Alternative is approximately 134m (440 ft) further west than the FEIS Alignment. The Preferred Alternative is therefore within 152m (500 ft) of approximately 10 more homes on the west side of the corridor than the FEIS Alignment.

Between Francis Avenue and Lincoln Road, the Preferred Alternative is shifted approximately one-half block to the east of the FEIS Alignment. The FEIS Alignment displaces homes along the east side of Freya Street, between Wilding Road and Lincoln Road, in the neighborhood known as Morgan Acres. It intrudes into the residential area on the west side, displacing 17-25 homes, but maintains the division between industrial and residential land uses. The Preferred Alternative, adjusted in response to the VE study for this segment, includes a redesigned interchange on Freya Street, and shifts the roadway one half block east. It avoids displacement of the first row of homes along Freya Street. The Preferred Alternative results in the displacement of approximately 35 single family homes in Morgan Acres. The Preferred Alternative also comes in proximity to a higher number of remaining homes as compared with the FEIS Alignment in this segment. In this neighborhood, there are 40 homes within 152m (500 ft) of the FEIS Alignment, and 45 homes within 152m (500 ft) of the Preferred Alternative. The indirect impacts to these residents are not mitigatable.

The FEIS Alignment passes within 30.5m (100 ft) of the southwest corner of the Mead Royale Mobile Home Community, which is located between Hawthorne Road and Farwell Road. The Preferred Alternative runs parallel to the western edge of this community, at an average distance of 30.5m (100 ft). The Preferred Alternative would therefore have increased noise and visual impact on the community center and outdoor recreation area, as well as to a higher number of homes in this neighborhood, as compared to the FEIS Alignment. These impacts are considered mitigatable with a buffer and/or noise wall.

The FEIS Alignment bisects a rapidly developing residential area between US 2 and US 395 at Wandermere, which is within the IUGA. While this area, known generally as Forest Glen, is zoned UR 3.5 (Urban Residential, permitting up to 1.4 units per hectare [3.5 units per acre]), it has generally been developed at roughly half of the allowed density. In addition to several single-family homes and duplexes, a 14-unit senior assisted living facility is displaced by the FEIS Alignment.

From the southwest corner of the Mead Royale Mobile Home Community, the Preferred Alternative diverges from the FEIS Alignment. The Preferred Alternative crosses US 2 at Shady Slope Road and then curves to the west, passing on the north side of the Northwood Middle/Farwell Elementary School complex. The residential areas directly impacted by this alignment are less densely developed and the homes were generally built less recently then those within the FEIS Alignment. The Garden City neighborhood is located north of US 2 and east of Shady Slope Road. This area is developed at maximum density of 1.4 units per hectare (3.5 homes per acre). Approximately five homes would be within the right-of-way of this alignment, at the intersection of Shady Slope Road and US 2. The neighborhood on the west side of Shady Slope Road is known as Garden City Addition. Both of these neighborhoods would experience impacts associated with having a depressed section of freeway between the homes and the elementary/middle school/county park complex. Residents of these areas currently have a short walk through undeveloped, wooded land to these facilities. This impact will be mitigated with the Pedestrian/Bicycle trail which will cross the NSC roadway to maintain pedestrian and bicycle access.

Table 4.9 summarizes the direct and indirect impacts to residences for each alignment alternative. **Table 4.10** presents the residential relocations by housing type and estimates the number of individuals affected.

Direct Impact : Number of Residential Relocations

Between the Spokane River and Hawthorne Road, the FEIS Alignment would result in the relocation of 67 residences (54 single-family, 2 duplex units, and 11 apartment units), and the Preferred Alternative would result in the relocation of 92 residences (77 single-family, 4 duplex units, and 11 apartment units).

Between Hawthorne Road and US 395 at Wandermere, the impact in terms of residential relocations is reduced by the selection of the Preferred Alternative. The FEIS Alignment results in the relocation of a total of 56 homes (36 single-family, 6 duplex units, and 14 residents of Willow Grove senior care home). The impact of the FEIS Alignment has increased in this area from the published FEIS due to continued development in this area. The Preferred Alternative results in the relocation of a total of 20 homes (all single-family).

Indirect Impact: Number of Residences within 500 feet of NSC right-of-way
The number of homes within 152m (500ft) on either side of the alignment right-of-way were counted using aerial photographs and field surveys. This was the method used in the FEIS to determine the amount of property likely to experience disruption as a result of the NSC. Between the Spokane River and Hawthorne Road, the number of residences within 152m (500 ft) of the NSC is 452 for the FEIS Alignment, and 447 for the Preferred Alternative.

FEIS Alignment, Hawthorne Road to US 395 at Wandermere
There are approximately 102 homes within 152m (500 ft) of the right-of-way:
34 in Mead Royale Mobile Home Community
12 in Camelot development
5 near Farwell/ Shady Slope Road intersection
51 between Hastings/Farwell Road and US 395 at Wandermere, including within US 2 interchange. This is an increase of 20 homes since the FEIS was published.

Preferred Alternative, Hawthorne Road to US 395 at Wandermere
There are approximately 146 homes within 152m (500 ft) of the right-of-way:
59 in Mead Royale Mobile Home Community
2 on Pittsburg south of Hastings Road
85 between Hastings/Farwell Road and US 395 at Wandermere, including within US 2 interchange

Table 4.9 Residential Impacts

Alignment Alternative	Direct Impact- Residences Displaced	Indirect Impact- Residences within 152m (500 ft)
FEIS Alignment	**123**	**554**
Preferred Alternative	**112**	**593**

Table 4.10 Residential Relocations

	Single Family Units includes mobiles	Multi-Family Units	Persons Per House-hold/uni	Total Persons Displaced
FEIS Alignment				
Spokane River to Francis Ave.	29	13	2.60	109
Francis Ave. to Hawthorne Rd.	25	- -	2.75	69
Hawthorne Rd. to US 395 at Wandermere	36	20*	2.75	130
Total	**123**			**308**
Preferred Alternative				
Spokane River to Francis Ave.	39	15	2.60	140
Francis Ave. to Hawthorne Rd.	38	- -	2.75	105
Hawthorne Rd. to US 395 at Wandermere	20	- -	2.75	55
Total	**112**			**300**

* This number includes 3 duplexes (6 units), and the 14-unit Willow Grove senior care home. Willow Grove units calculated as one person per unit.

Potential Development- Preliminary Plats

"Wandermere Heights," a preliminary plat for a major residential, resort, and recreation development associated with the Wandermere Golf Course, has been under review by the County since 1980. The proposal has not had any significant activity since 1993.

A preliminary plat for a major residential development between US 2 and US 395 at Wandermere was filed with the County since the FEIS was published. The proposed development, "Stonehorse Bluff," involves 43.7 hectares (108 acres). It proposes a rezone from UR-3.5 to UR-7, and a replat to 606 lots under the proposed UR-7 rezone with a Planned Unit Development (PUD) overlay. The FEIS Alignment would affect the southwest corner of the property, reducing the number of potential lots by approximately 118 under the proposed zoning. The Preferred Alternative would also impact this property, but would pass through it close to the northern boundary, and would reduce the potential number of lots by approximately 149 under the proposed zoning. The Spokane County Hearing Examiner denied this proposed preliminary plat, zone change, and PUD overlay zone request on June 30, 2000, and that decision has been appealed by the developer.

Another rezoning and development in the study area under review by the County, "Aspen Meadows," is a proposed senior housing community. The proposed development includes an 82-unit retirement community (14-unit assisted living facility and a 68-unit independent living facility). A rezoning from UR-7 to UR-22 has been approved along with the preliminary site plan. This future development would be within 152m (500 ft) of the FEIS Alignment. It is avoided by the Preferred Alternative.

Environmental Justice

The preferred alternative alignment impacts a range of population and housing types throughout the corridor. Two locations are discussed here because the residents are relatively lower-income.

SNAP's 11-unit apartment complex for low-income residents on Greene Street is displaced by both alternative alignments. This complex was built, after the 1997 FEIS was published, within the proposed right-of-way of the then-preferred alignment. The new preferred alignment is unchanged in this location. The proposed NSC alignment in this vicinity is following the Greene Street alignment to minimize overall impact to residences and to the Spokane Community College. SNAP has stated that the complex will be rebuilt in a different location within the same neighborhood.

The Morgan Acres neighborhood, between Francis Avenue and Lincoln Road, east of Freya Street, will be more heavily impacted by the Preferred Alternative than by the FEIS Alignment. (See residential impacts, p. 24-26.) Approximately 30 single-family homes (including mobile homes) will require relocation from this neighborhood with the Preferred Alternative. The FEIS Alignment would require relocation of approximately 17-25 homes. This neighborhood is within Census Tract 112.01, Block Group 2, in which the minority population is lower than county-wide; the population over the age of 65 is slightly higher than county-wide; the median household and per capita incomes are lower than county-wide; the percentage of persons living below poverty level (19.8%) is higher than county-wide (13.7%); the percentage of home ownership is slightly higher than county-wide; and the median home value ($45,300) is lower than county-wide. These statistics, as reported in the FEIS, are taken from the 1990 US Census.

This semi-rural residential area is within the Hillyard Neighborhood Council area, but outside of the Hillyard Community Development Neighborhood, because it is outside of the Spokane City limits. However, Morgan Acres did receive a Spokane County Community Development Block Grant of $1.7 million for neighborhood revitalization in 1986. The revitalization included making improvements to 56 homes ($25,000 each), paving streets, and constructing the new water tower on an adjacent property.

Relocation for displaced residents of Morgan Acres will be difficult. The neighborhood is zoned Semi-Rural Residential and is adjacent to the city limits. It has a unique combination of having large lots, agricultural animals and accessory uses permitted, along with STA bus service and proximity to employment areas and city services.

In order to avoid impact to this neighborhood, acquisition of the TOSCO property, which is part of the North Market Street Superfund Site, would be necessary. This is a complex of seven sites, which have significant but not quantified contamination.

The FEIS Alignment has a lower impact on Morgan Acres, not only in terms of total number of homes displaced, but the significance of intrusion into the neighborhood. The FEIS Alignment would require displacement of 17-25 homes along the west side of the

neighborhood, essentially widening the separation between the residential area and the industrial land on the west side of Freya Street. The Preferred Alternative intrudes further into the interior of the neighborhood. It would create a large barrier approximately through the middle of the residential area, and leave a one-block wide strip between Freya Avenue and the NSC. Noise walls in this location do not meet WSDOT cost/benefit standards. However, WSDOT will evaluate alternative means of noise abatement for this neighborhood as the project progresses. (See Noise Impacts, this Chapter.)

The dislocation of the residents within the two areas discussed above does not constitute disproportionately high and adverse impacts on low-income population because the residential impacts throughout the corridor are not predominately borne by low-income persons, and will not be appreciably more severe or greater in magnitude than the adverse effect that will be suffered by the non-low-income population. In no location along the corridor are low-income residents impacted to avoid or reduce impacts to non-low-income residents.

Mitigation

The direct impact to residences, in terms of residential relocations, is reduced by the selection of the Preferred Alternative, from a total of 122 to 109. Meanwhile, the number of residences expected to experience indirect impact due to proximity is increased with the selection of the Preferred Alternative, from a total of 554 to 593. Washington State compensates for proximity damages only when there is a partial acquisition of an improved property. Any adverse effect to a specific property due to proximity to the new roadway is unknown at this time.

Relocation

Impacts

The general relocation background and impacts are unchanged from the FEIS (pages 4-105 through 4-108, 4-148, and 4-161 through 4-172. The occupancy type and resident characteristics along the corridor have not changed significantly from the information reported in the FEIS.

The number of residence and business relocations resulting from each alignment are described in this chapter under “Residential Land” and “Industrial Land/Business and Employment.”

Mitigation

Mitigation of impacts for relocation will be in accordance with the “Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as Amended,” as described in the FEIS (pages 4-172 through 4-179). WSDOT has documented 32

advance acquisition requests in the approved Relocation Assistance Program Plan (approved September 14, 1999).

The early coordination with neighborhoods and housing groups to minimize disruptions as mentioned in the FEIS (p. 4-148) has begun. The objectives of the NSC Pilot Housing Program are to provide replacement housing stock along the corridor, preserve the architectural integrity of neighborhoods by in-filling, provide additional low income housing stock, and maintain decent, safe, and sanitary housing within the NSC right-of-way until construction of the NSC takes place.

Tax Revenue

The acquisition of land for right-of-way for either alignment alternative will displace businesses and residences, resulting in a loss of property tax revenue. This is expected to be offset by the relocation of displaced land uses to other sites within the metropolitan area. Where City and County Comprehensive Land Use Plans permit, increased intensity in land use resulting from the NSC are expected, primarily around interchanges.

Over the long term, the project is not expected to have a significant impact on overall property tax base along the route.

Property Values

Improved access to commercial and industrial properties is expected to bring about an increase in their value. The Wellesley Avenue and Francis Avenue interchanges are expected to result in substantial access improvements through the Hillyard business district. Removal of the through truck traffic in the district could enhance the area for shoppers, and could result in increased rents and property values.

The potential damage in value to single family residential properties was addressed, in a general manner, in the report, "Proximity Study; North South Limited Access Corridor, Spokane, Washington" (Michael Ward, WSDOT Real Estate Service, May 21, 1999). The study attempted to measure the affect of the proposed freeway on residential properties in terms of their Fair Market Value. The direct market comparison technique used matched pair properties similar in all aspects except for the property's proximity to a heavily traveled corridor. The negative elements associated with proximity that can potentially effect a parcel's market value include: noise, dust, vibration, fumes, loss of privacy and safety. The conclusions of the comparison method are limited in this situation, since the NSC is not a pre-existing route. There are no true comparables available in Eastern Washington that can measure the overall affect caused by the new corridor. Residents currently living along or near the high traffic corridors used for comparison were aware of the negative attributes associated with that location before they purchased the property.

The findings of the analysis concludes that housing located adjacent to heavily traveled roadways could suffer a loss in value which varies with the value of the home and the quality and condition of the home. Properties selling for $90,000 or less typically are

entry level homes, and the location is only a small factor in the decision to buy. These homes, of fair to average quality, could experience a loss in market value from 0% to 5.5 %. Homes selling in the range of $90,000 - $185,000, in good condition, have the potential of experiencing a loss in value from 8% from 13%. These variances in selling prices also reflect the typical negotiation range in real estate transactions in general.

Regional and Community Growth

Impacts

The general impacts of the NSC on regional and community growth are described in the FEIS (pages 4-97, and 4-142 through 4-144).

Due to the minor difference in location between the alignment alternatives between the Spokane River and Hawthorne Road, there are no differences from the FEIS in terms of regional and community growth. Both alignments are held within or adjacent to the existing BNSF railway alignment north to the Francis Avenue/Freya Street interchange. This existing transportation corridor has established a general division between the east and west side.

From Hawthorne Road to Farwell Road, the Preferred Alternative roughly follows existing boundaries between residential and industrial land uses. The Preferred Alternative dislocates fewer businesses and fewer homes overall as compared to the FEIS Alignment, and it avoids a recently developing residential area.

Community Cohesion / Neighborhoods

Disruptions to traffic circulation and all other aspects not described here are unchanged from the FEIS. Impacts in terms of community cohesion are unchanged from the FEIS (pages 4-133 through 4-135), with the following addition.

Between Francis Avenue and Lincoln Road, the Preferred Alternative intrudes into the Morgan Acres Neighborhood, while the FEIS Alignment widened, but maintains the division between the industrial activity on the west side of Freya Avenue and the residential use on the east side. More households will be relocated and more homes will be in proximity to the NSC with the Preferred Alternative than with the FEIS Alignment. Morgan Acres is a unique community, having a semi-rural character adjacent to the city limits, and possessing relatively clear boundaries and strong community identity. The elevated Preferred Alternative will create a physical barrier through this neighborhood, and leave a one-block wide strip, containing approximately 12 homes, in between Freya Avenue and the NSC.

Between Hastings/Farwell Road and US 395 at Wandermere, both of the alternative alignments would create a barrier between neighborhoods and schools. Residents of both areas have expressed concern on this issue. The Mead School district stated that most of the students that walk to school live north of the schools, or east of Shady Slope Road.

According to comments from the community, the recently widened Hastings Road (by Spokane County) already creates some barrier between neighborhoods to the south and the schools.

While the FEIS went through full public process, residents of the Garden City neighborhood and vicinity were outside of the published preferred route. Comments from residents of the Garden City area point out that the development that is now being avoided by the northern portion of the Preferred Alternative is recent development and even proposed development; activity which had the warning of being within the corridor due to the published FEIS. Comments from residents in these areas express that the neighborhoods impacted by the Preferred Alternative are more established and cohesive, having been in existence approximately thirty years, and therefore will be experience greater impact than will the newer homes built within the FEIS Alignment.

Mitigation

Mitigation for impacts remain as in the FEIS (page 4-150), with the following addition.

The pedestrian/bicycle trail adds a connection for the communities along the NSC. It will provide a pedestrian/bicycle crossing of the Spokane River, connecting neighborhoods on the north side of the river with the Spokane Community College and downtown Spokane. It will provide a convenient connection for the Bemiss and Hillyard neighborhoods to the Centennial Trail. The pedestrian/bicycle trail will incorporate a crossing of the BNRR tracks and the NSC at Garland Avenue, connecting to the J. J. Hill/Wildhorse Park. This will maintain pedestrian access between the Cooper Elementary, Bemiss Elementary, and Shaw Middle Schools on the east side of the NSC with neighborhoods within its attendance boundary on the west side of the NSC.

The pedestrian/bicycle trail will help to mitigate the additional barrier created by the Preferred Alternative. The trail will facilitate bicycle and pedestrian crossing of the NSC, Hastings/Farwell Road, and US 2, and help maintain the connection between the Garden City Neighborhood and schools and play fields.

Parks and Recreation

Impacts

Between the Spokane River and Wellesley Avenue, the impacts in terms of parks and recreation are unchanged from the FEIS (pages 4-137 through 4-138).

Between Wellesley Avenue and Francis Avenue, the Preferred Alternative is approximately 137m (450 ft) west of the FEIS Alignment. The resulting differences in impacts are shown in **Table 4.11**. All of the recreation sites shown below were evaluated in the FEIS, and were found to not be significantly impacted from the FEIS Alignment due to distance and the depressed roadway profile. While several of these are subject to

Section 4(f) regulations, the impacts do not result in a "use" or "constructive use" of the sites.

Table 4.11 Park and Recreation Properties

Feature	distance from centerline, FEIS Alignment	previously documented impact	distance from centerline, Preferred Alternative	difference in impact
Cooper Elementary School	340 m/ 1100 ft	no impacts due to depressed road and distance	400 m/1300 ft, depressed roadway	no change in impact
Courtland Neighborhood Park	760 m/ 2500 ft	no impacts due to depressed road and distance	730m/2400 ft, depressed roadway	no change in impact
J.J. Hill Park/ Wildhorse Playground	adjacent	impact mitigated with depressed roadway and 12 ft noise wall	adjacent	no change in impact
Esmeralda Golf Course	430 m/ 1400 ft	no impacts due to depressed road and distance	440 m/ 1444 ft, depressed road	no change in impact
Shaw Junior High and Regal Elementary Schools	460 m/ 1500 ft	no impacts due to depressed road and distance	493 m/ 1617 ft, depressed road	no change in impact
Hillyard Swimming Pool	270 m/ 900 ft	no impacts due to depressed road and distance	157 m/ 516 ft, at grade	increased impact
Sharpley-Harmon Park	290 m/ 950 ft	no impacts due to depressed road and distance	156 m/ 511 ft, 4.6 m/15 ft above grade	increased impact
Arlington Elementary School	820 m/ 2700 ft	no impacts due to depressed road and distance	696 m/ 2285 ft, 7.6 m/25 ft above grade	no change in impact

In comparison to the FEIS Alignment, the Preferred Alternative has increased impact on some of these sites. Whereas the FEIS Alignment had no impact on the Hillyard public swimming pool due to the distance and the roadway being in depressed section, the Preferred Alternative passes approximately 122m (400 ft) closer, and is just emerging from a depressed section to a raised section at this point. There is a similar difference in regard to the Sharpley-Harmon park and playfields, approximately 244m (800 ft) north of the swimming pool. At this location the Preferred Alternative is proposed to be approximately 4.5m (15 ft) above existing ground level. While the impact for both of these recreational sites would be increased in comparison to the FEIS Alignment, the impact is still not considered significant due to these sites being on the west side and adjacent to the existing Market Street. Market Street is and will remain the primary noise and visual impact to these two sites.

The Preferred Alternative is farther away from the Esmeralda Golf Course and the Shaw Junior and Regal Elementary School grounds.

The only park north of Hawthorne Road in the study area is Farwell Park, on the north side of Hastings Road between Pittsburg and Crestline Streets. It is included in the Farwell Elementary School and Northwood Middle School complex, and is jointly owned by the Spokane County and the Mead School District. Farwell Park is 4 hectares (10 acres) in size. The total complex site is approximately 14.6 hectares (36 acres) in size, and is equipped with two baseball fields and a track.

The Preferred Alternative passes to the north of the school complex approximately 270m (900ft) at the closest point, while the FEIS Alignment passes to the south, approximately 61m (200 ft) at the closest point. The outdoor recreation areas are subject to noise and visual impacts with the FEIS Alignment. The school buildings lie between the recreation area and the proposed new alignment. The Preferred Alternative will eliminate the visual impact to the outdoor areas, and greatly reduce the noise impacts. Hastings/Farwell Road is the primary noise and visual impact to the schools, and will remain so after the completion of the NSC.

Impacts to the Wandermere Golf Course are the same as described in the FEIS (p. 4-141).

Mitigation

No mitigation is required or proposed.

Farmland

Impacts

The Preferred Alternative impacts more land with prime farmland soil than did the FEIS Alignment; the proposed roadway with a 152 m (500 ft) right-of-way in this location would include 4.3 hectares (10.6 acres) of this farmland soil. However, there is no increased impact on farmland since this area is not zoned for agriculture and is not used for agriculture. The Natural Resources Conservation Service, which implements the Farmland Protection Policy Act, has made the interpretation that this area is exempt from the regulation due to current zoning and land use.

> Farmland Protection Policy Act (FFPA), 7 USC 4202, Rules, 7 CFR Part 658, Sec. 403.4, Exempted Conversion and Farmland Exclusions:
> (c) Lands that are already in or committed to urban development

The indirect impacts on agricultural land of project-induced urban growth northeast of the City are not changed from the FEIS, p. 4-84. The limitation of growth outside of the IUGA depends upon the enforcement of development regulations by Spokane County. **(See Prime Farmland Soils Map, Figure 3.11)**

Mitigation

There is no mitigation required or proposed.

Services

Impacts

The impacts in terms of services of the FEIS Alignment and the Preferred Alternative are unchanged from the FEIS (pages 4-146 through 4-147), except as described below.

Educational Facilities

Although the Preferred Alternative passes closer to some schools and farther from others between the Spokane River and Hawthorne Road, the difference in proximity is not enough to affect the status of no significant impacts, as described in the FEIS (p. 4-138 through 4-139).

Between Hawthorne Road and US 395 at Wandermere, impacts associated with the Preferred Alternative, and changes in impacts of the FEIS Alignment due to changed conditions, are described below.

There are two schools in the study area, Farwell Elementary and Northwood Middle School. The FEIS Alignment would be within approximately 259m (850 ft) of the school buildings and 61m (200 ft) of the outdoor use area. The Preferred Alternative passes further from the buildings, at approximately 274m (900 ft), and much further from the outdoor use areas, at 427m (1400 ft).

The Mead School District recently (August 1998) purchased the Wismer-Martin building for administrative office space. The building is located north of Farwell Road just east of US 2, and will house 66 employees. The FEIS Alignment would have resulted in removal of this building, while the Preferred Alternative avoids direct impact to it.

Both of the alignments cross the school district attendance boundary, and would require changes to bus routes and affect pedestrian access to the schools and park. The school district Assistant Superintendent has stated that the district's concern is about how school bus circulation and vehicle traffic will be affected around the two schools. The District's preference of the alignment alternatives is the WSDOT's Preferred Alternative since it is furthest from the school site **See School Attendance Boundaries Map, Figure 4.2.**

Fire Protection

The segments in which the alignment revisions deviate from the FEIS Alignment occur between Francis Avenue and US 395 at Wandermere. This area is served by Fire District No. 9. The Fire District advised WSDOT on its service standards, which were incorporated into the design of the alignment revisions. There is no difference in the

impacts, and no disruption of service, with either the FEIS Alignment or the Preferred Alternative . **See Fire District Map, Figure 4.3.**

CLICK HERE TO DOWNLOAD FIGURE 4.2(a) (435k)

School Attendance Boundaries **FEIS Alignment, southern**
Figure 4.2(a)

CLICK HERE TO DOWNLOAD FIGURE 4.2(b) (420k)

School Attendance Boundaries Preferred Alternative, southern
Figure 4.2 (b)

CLICK HERE TO DOWNLOAD FIGURE 4.2(c) (285k)

School Attendance Boundaries **FEIS Alignment, northern**
Figure 4.2 (c)

CLICK HERE TO DOWNLOAD FIGURE 4.2(d) (426k)

School Attendance Boundaries Preferred Alternative, northern
Figure 4.2 (d)

CLICK HERE TO DOWNLOAD FIGURE 4.3(a) (620k)

Fire Districts **FEIS Alignment**
Figure 4.3 (a)

CLICK HERE TO DOWNLOAD FIGURE 4.3(b) (288k)

Fire Districts **Preferred Alternative**
Figure 4.3 (b)

Religious and Social Institutions

The Mead United Methodist Church would be displaced with the FEIS Alignment. The Preferred Alternative avoids displacement, taking a portion of the church's parcel and temporarily disrupting parking. While the FEIS Alignment is 123m (400 ft) south of the Fairwood Community Baptist Church, the Preferred Alternative is approximately 457m (1500 ft) north of this church. The Preferred Alternative lessens the impacts of the NSC on both of the existing churches in the vicinity.

Water and Sewer

Since the FEIS was published, an additional water supply well has been located near Helena Street and Hastings Road, which falls within the FEIS Alignment. This well was established by the Spokane County Water District No. 3 in 1996, at a cost of $700,000. The wellhead protection zone is a 30.5m (100 ft) radius from the well, which precludes road construction and stormwater disposal. This new well is within the FEIS Alignment. The Preferred Alternative avoids impact to this new well (over 305m (1000 ft) away), as well as all other water supply wells and wellhead protection zones in the vicinity.

The Preferred Alternative passes within 15m (50 ft) of an Spokane County Irrigation District # 8 water supply tank. A 36cm (14 inch) water line and spill pad will be disturbed with this alternative. Coordination will continue between WSDOT and the Irrigation District to maintain operation of the water supply.

There is no change or difference in impacts in terms of sewer service.

Mitigation

Mitigation for the impacts of the FEIS Alignment and the Preferred Alternative remains as in the FEIS (pages 4-150 through 4-151). The impacts on services for the north end of the project are reduced by the selection of the Preferred Alternative.

Transportation

The VE Study recommended an interchange at Parksmith Drive rather than at Stoneman Road. Once modeled with current traffic information the Francis Avenue interchange as proposed in the FEIS was found to not function adequately in terms of Level of Service and air quality. Additionally, the interchange ramps would have impacted two major businesses, Pasta USA and Food Services Inc., as well as the TOSCO property, which is a Superfund site. The interchange was therefore redesigned to be located primarily on Freya Street, with an eastbound Francis Avenue ramp onto the southbound NSC. The redesign improved the Level of Service and air quality in this vicinity, but resulted in an increased impact on the Morgan Acres neighborhood, east of Freya Street.

Frontage Roads

Frontage roads needs were identified in two areas of the Preferred Alternative: from Lincoln Road north to the vicinity of Piper Road on the east side of the NSC, and north and south of US 2 from the north side of Deadman Creek (in the vicinity of Shady Slope Road) to the vicinity of Deer Road. Preliminary alignments have been established for the frontage roads. Determination of the final alignments will involve coordination with Spokane County and emergency services.

Public Transit

All proposed alignments reserve right-of-way for possible light rail lines.
There are no changes in impacts in terms of public transit from the FEIS.
STA's most recent Master Plan references the North Spokane Freeway, and states:

> Any change in transportation patterns within north Spokane will need to be closely coordinated with transit service to ensure an appropriate mix of transportation alternatives are available. STA will be a part of these studies and implementation as they occur. (STA, Transit Development Plan 1999-2005, p. 5.6.)

Pedestrian and Bicyclist Facilities

Children living on the south side of Hastings generally do not walk to the elementary and middle school on the north side due to the lack of safe crossing. Students who walk to school generally live directly north and northeast of the school complex (sources: Mead School District Transportation Coordinator; and a neighborhood leader from Camelot Neighborhood). Busing is also available for these students. The pedestrian/bicycle path will bridge the NSC to maintain a connection between the Garden City neighborhood and Northwood Middle and Farwell Elementary schools and play fields.

Both alternative alignments include provisions for a pedestrian/bicycle/non-motorized path within the right-of-way. This is much needed throughout the corridor, especially north of Francis where there are few options for non-motorized travel. The proposed pedestrian/bicycle trail within the NSC right-of-way was only in a preliminary conceptual stage at the time the FEIS was completed. The FEIS (p. 4-132), states, "bicycle traffic will be prohibited on viaduct portions of the freeway, primarily from the I-90 interchange to the Wellesley interchange. Bicycle traffic would have access to the freeway at Wellesley Avenue, and would use the shoulder for travel on the freeway from that point northward. No bicycle traffic would be allowed southbound from Wellesley Avenue."

This concept has been expanded to a full-length pedestrian/bicycle trail along the NSC. **See Pedestrian/Bicycle Trail Map, Figure 4.4.** This part of the project will provide an alternative transportation mode route the full length of the corridor. The pedestrian/bicycle route will be a paved, separated pathway, within the NSC right-of-way.

CLICK HERE TO DOWNLOAD FIGURE 4.4 (277k)

Pedestrian/Bicycle Trail
Figure 4.4

County Urban Connectors

There is no difference in impact in term of the County Urban Connectors between the FEIS Alignment and the Preferred Alternative. The Comprehensive Analysis of the Urban Connectors states that the connectors will enhance the overall efficiency of the NSC by providing additional system capacity and reducing demands on the congested section of I-90 between the Liberty Park Interchange and the Sprague Avenue Interchange. **(See Urban Connectors Map, Figure 3.15.)**

Cultural Resources

Impacts

The identification of cultural sites within the proposed Preferred Alternative included extensive involvement of the Spokane Tribe of Indians (STI). WSDOT, Eastern Washington University Archaeological and Historical Services (EWU-AHS), and the STI developed a plan to survey two sites of interest in the corridor. The survey found one confirmed significant cultural site, on a promontory landform just north of Gerlach Road (the Wittkopf Site). This site has been identified by the Spokane Tribal Historic Preservation Officer (THPO) and the Tribe's archaeologist as a significant cultural site associated with the STI. WSDOT responded by revising the proposed alignment in this area to avoid direct impact to this cultural feature. The site will be impacted visually and audibly by the NSC. The site is privately owned, and is no longer used in the culturally traditional manner. The interest of the STI and intent of WSDOT is to avoid loss of, or physical damage to, the site. Therefore, the indirect impacts do not result in interference with the essential functions of the site, and do not result in a 4(f) impact.

The investigation of the second site, performed with a STI elder present, concluded that the site held no cultural significance.

FHWA has concurred with WSDOT's documented process of compliance with the tribal consultation requirements of CFR 36, prior to the November 1999 revisions to Section 106 of the National Historic Preservation Act. WSDOT is now initiating formal consultation with all tribes in the region in order to comply with the new regulations.

The State Historic Preservation Officer (SHPO) concurred with EWU-AHS's determination that no sites investigated within the proposed corridor are likely to be eligible for listing in the National Register of Historic Places. (Letter from SHPO dated June 7, 2000 is on file.)

Mitigation

The proposed alignment was altered to avoid directly impacting the Wittkopf site. Indirect effects (including visual, audible, and atmospheric) will constitute no adverse effect to the site. Construction activities should be kept as far away from the Wittkopf site as possible. WSDOT should ensure that access to the site is not permitted during

construction. As a precaution, the Spokane Tribe recommends that excavation of the upper few feet of the cut to be made nearest the Wittkopf site be monitored by an archaeologist.

Clearing of the forested areas between Fairview and Piper Roads should be monitored, as investigation of a nearby possible site of interest to the Spokane Tribe proved inconclusive. Should cultural resources be encountered during construction, the Spokane Tribe and office of Archaeological and Historical Services of Eastern Washington University in Cheney, Washington, should be notified immediately.

Release of culturally sensitive information will be subject to the provisions of the Spokane Tribal Cultural Resource Protection Ordinance. Compliance with that Ordinance, although not mandatory off the Spokane Indian Reservation, should ensure WSDOT compliance with the disclosure provisions of the National Historic Preservation Act, the Archaeological Resources Protection Act, and Executive Order 13007.

Hazardous Waste

Impacts

Between the Spokane River and Lincoln Road, no new or different confirmed or suspected contaminated sites are involved in the Preferred Alternative as compared to the FEIS Alignment. This portion of the corridor has undergone an intrusive investigation performed by an environmental consulting firm and WSDOT personnel. The sites of greatest impact in this part of the corridor are the same for the FEIS Alignment and the Preferred Alternative: Burlington Northern and Santa Fe Railroad/Hillyard Rail Corridor, Koch Materials, and The Plant. All soils within the Preferred Alternative right-of-way where hazardous materials were suspected were specifically investigated. The remainder of the former rail-corridor was investigated using a planned grid method. The updated estimates for these properties are shown in **Table 4.12**.

Burlington Northern and Santa Fe Railroad/Hillyard Rail Corridor, and Koch Materials

In these adjacent sites, the impacted soils were generally shallow (less than 3m [10 ft] in depth). The soils were classified by the nature and extent of the contaminants found, using a site-specific, elevated MTCA Method A Industrial cleanup level. The highly contaminated soils will require off-site disposal. The remainder of the impacted soils may be contained on site. The containment issue will require concurrence by Washington State Department of Ecology (WDOE), and may cause the right-of-way to fall under a deed restriction. The preliminary construction plans within the rail yard corridor appear to be able to contain those soils as required.

The Plant

This site is the location of an acetylene gas manufacturing and distribution facility. There was speculation the materials in the existing unlined slurry pond may designate as a hazardous material; however, analysis revealed that it does not. The characteristic of the

slurry material reportedly forms a bottom seal in the pond, preventing further soil or groundwater contamination. Based on the analytical results, nothing above the selected cleanup limits was detected. Worker safety issues and a material handling plan will be required to be in place prior to dealing with these materials.

Table 4.12 Hazardous Site Remediation Estimate for Koch Materials, Burlington Northern/Hillyard Rail corridor, and The Plant

Identified Contaminant	Estimated Disposal Quantity	Estimated Containment Quantity	Total Estimated Remedial Cost
Petroleum, SVOC's, and Metals	13,212 m^3 (17,280 $yd^{3)}$	115,882 m^3 (151,568 $yd^{3)}$	
Estimated Cost	$1,296,000	$456,000	$1,752,000

(Note: The FEIS reported an estimated remediation cost for these sites of $19,319,600. This estimate was prior to intrusive investigation.)

Between Lincoln Road and US 395 at Wandermere, the proposed alignment revisions result in the avoidance of some previously identified contaminated sites; however, some new sites are encountered (**See Known and Suspected Contaminated Sites Map, Figure 4.5**). The methodology used in the investigation of the sites within the Preferred Alignment has progressed beyond that used in the FEIS. Following potential hazardous site identification, the field investigations consisted of soil sampling for each parcel. From the soil investigation findings, it was determined that no groundwater impacts were resulting. The estimated remediation of these sites is shown in **Table 4.12**.

Swanson Hay Trucking

This site has been used as the office and vehicle maintenance facility for Swanson Hay since 1982. The property contains a 18,931 liter (5,000 gallon) diesel above ground storage tank. This tank and soils around it, estimated at 49.7m^3 (65 $yd^{3)}$, will be removed. There is no evidence of any other potentially hazardous materials. There are both septic systems and a water well that will require decommissioning prior to construction.

Costich Fertilizer Plant

This former fertilizer manufacturing facility reportedly operated until about 1969. A building, assumed to be the main manufacturing facility, remains as does much of the machinery used in this operation. Such a large quantity of solid waste is located on this site that only a partial investigation was possible. Estimates for the suspect petroleum contaminated soil total 405m^3 (530 $yd^{3)}$. Numerous unidentified drums (estimated 2,272 liter [600 gallons] total) of liquid were also found on this parcel. These liquids will require identification testing and disposal coordination. The estimated partial remediation cost on this parcel may vary once the solid waste is removed and the hazardous materials investigation can be completed.

Devlin Property

The Preferred Alternative involves a portion of this property which is adjacent to an operational gravel pit site (Acme). The former site of a rock crushing operation has reportedly been used as a dumping site for demolition debris as well as numerous 208 liter (55-gallon) drums. The content of the drums is unknown. Test pits revealed petroleum contamination slightly exceeding current cleanup levels. It is believed that the levels and quantities are low enough that containing them on site will be the most viable option. An estimated 1,529m^3 (2000 yd^3) on this site will require special handling.

Wilson Landfill

Between 1987 and 1991, a former owner used this site as a permitted inert and demolition waste landfill. The closed landfill file was reviewed at the Spokane County Health Department. No violations were noted in the file. The facility appears to have previously been a borrow pit due to the irregular topography and historical photographs.

This site required investigation of soils due to the historical usage. However, the soils did not designate as hazardous material. The excavations did reveal large quantities of woody debris that will not be suitable base material for road building and will require excavation (see "Topography" section). Estimates are for the relocation of 123,093m^3 (161,000 yd^3) of debris. The disposition of this material will be determined by reaching an agreement with the Washington State Department of Ecology to relocate and encapsulate the debris to another portion of the same parcel, outside of the NSC right-of-way. Should an agreement not be reached, this site may be considered a dump site and the excavated materials will require special disposal. At this time, this will be treated only as a non-suitable fill construction issue.

Table 4.13 Confirmed or Suspected Hazardous Waste Sites Impacted by the Preferred Alternative

Site identification	Location	Affected media & est. quantity	Investigation & Remediation Estimate
Wilson landfill	Lot 25 S15 T26N R43E SW ¼	Soil	---
Swanson Hay Co. Trucking	Lot 86 S15 T26N R43E NW ¼	Soil 49.7m^3 (65 yd^3)	$10,000
Former Fertilizer Mfg. Plant (Costich-owner)	Lots 60A&B S15 T26N R43E NW ¼	Soil 405m^3 (530 yd^3) plus 2,272 liter (600 gal.) liquid	$90,000 (investigation is not complete)
Devlin Property	Lots 113-122 except 119 S4 T26N R43 E S 1/2	Soil 1529m^3 (2000 yd^3)	$8,000
Total		1983.7m^3 , 2,272 liter (595 yd^3 , 600 gal)	$118,000

Additional contaminated media or hazardous material can be expected to be found along the NSC before and during construction. Underground and above ground storage tanks,

and home heating oil tanks will be found containing hazardous material as well as having contaminated media surrounding them. Drywells and septic systems are commonly misused for hazardous material disposal. Asbestos may be encountered in structures or used as insulation for underground utility lines.

The proposed alignment revisions in this section will result in avoidance of some sites previously identified in the FEIS as impacted, shown in **Table 4.14.** Stormwater runoff remains an issue within the vicinity of some of these sites. In the vicinity of the North Market Street and Kaiser Aluminum sites, stormwater should still be subject to hydrogeologic investigation to assure that no additional impacts are caused by NSC project. It should be noted that the sites in **Table 4.14** have not had intrusive investigation. The affected material volumes and remediation costs listed were estimated as described for the FEIS, and have not been further refined. Meanwhile, the sites identified within the Preferred Alignment (**Table 4.13**) have had further investigation, making the remediation cost estimates for these sites more accurate.

Table 4.14 Hazardous Waste Sites Avoided by Selection of the Preferred Alternative north of Lincoln Road

SITE INFORMATION	IDENTIFIED or SUSPECT CONTAMINANT	AFFECTED MEDIA	REMEDIATION ESTIMATE (SAVED) $
North Market Street Site (TOSCO) 3225 E. Lincoln Rd.	1) Petroleum 2) PAHs 3) Solvents 4) Halogenated organics	Soil Groundwater Drinking water	15,000*
Cram's (C&T Salvage) 9700 N. Market	1) Four, waste oil USTs 2) Petroleum spillage	Soil	(100,000 (50,000)
Precious Metal Auto Body 9700 N. Market	1) Paint wastes 2) Petroleum spillage	Septic/Drain Soil	(10,000) (10,000)
Mead Auto Parts 9700 N. Market	1) Petroleum spillage	Soil	(50,000)
Mead Auto Glass 9700 N. Market	Not highly suspect		∅
Allan's Motorcycle 9700 N. Market	1) Petroleum spillage	Soil	(10,000)
Jacks Automotive 9700 N. Market	1) Petroleum spillage	Soil	(30,000)
C&T Truck Parts 9902 N. Market	1) One, waste oil UST 2) Petroleum spillage	Soil	(20,000) (150,000)
Kaiser Aluminum Hawthorne Rd.	1) Cyanide Plume	Groundwater	∅ **
TOTAL SAVED			**($415,000)**

* See site description and comments, Limited Initial Site Assessment of Known and Suspected Contaminated Sites on Proposed North Spokane Freeway Alternatives, 1995; p. 91.
** See site description and comments, Limited Initial Site Assessment of Known and Suspected Contaminated Sites on Proposed North Spokane Freeway Alternatives, 1995; p. 98.
Note: Allan's Motorcycle, included in impacts in the FEIS, has moved outside of the corridor.
The McKinley BS/SF dump site previously identified has completed cleanup.

Mitigation

A joint comprehensive investigation of the Preferred Alignment between Hawthorne Road and US 395 at Wandermere was performed by WSDOT and an environmental consultant. Remediation costs were estimated based on this investigation, and are presented in **Table 4.13.**

All structures, either residential or commercial, that necessitate demolition for the completion of this project will require both an asbestos and a lead paint survey. All asbestos and lead paint found during these surveys will require abatement measures in compliance with all regulations both for disposal and for worker safety. Heating oil tanks, although considered exempt, will be removed in accordance with all regulations. Septic systems and water wells will require decommissioning in accordance with State and Spokane County regulations.

Any site containing hazardous materials not identified during this assessment, discovered during the construction of this project will be reported and mitigated as required by all hazardous materials regulations.

During construction, all contractors are required to have and follow a detailed Spill Prevention Containment and Countermeasures Plan, prepared in accordance with WSDOT and WDOE guidelines. This plan covers spills of fuels, petroleum lubricants, or any other hazardous materials required to be on site for construction purposes. This plan also develops procedures for recognizing and controlling unknown contamination discovered during construction.

These procedures must provide training for recognition of contamination and hazardous conditions and reporting of such conditions to management and the proper regulatory agencies. The prime concern is to protect worker health and safety and the environment.

CLICK HERE TO DOWNLOAD FIGURE 4.5(a) (283k)

Known and Suspected Contaminated Sites **FEIS Alignment**
Figure 4.5 (a)

CLICK HERE TO DOWNLOAD FIGURE 4.5(b) (308k)

Known and Suspected Contaminated Sites **Preferred Alternative**
Figure 4.5 (b)

Visual Quality

The proposed alignment changes were assessed and compared to the FEIS Alignment as documented in the FEIS, in terms of visual quality **from** and **towards** the proposed corridor.

Visual quality was analyzed for existing conditions and for the future build proposal. The following criteria were assessed on a scale ranging from 0 to 7, with 7 as the highest score. The average scores are shown in the **Table 4.15**.

- Vividness (memorability of impression of landscape components)
- Intactness (integration of natural and human components)
- Unity (compositional harmony of the view)

Table 4.15 Visual Quality Score

Alternative	Average Score	
	From	Toward
Spokane River to Hawthorne Road		
FEIS Alignment	3.54	5.80
Preferred Alternative	3.80	5.15
Hawthorne Road to US 395 at Wandermere		
FEIS Alignment	3.4*	3.4*
Preferred Alternative	8.5	6.7

* unchanged from the FEIS, p. 4-233.

Impacts

Views From the Facility

The difference between the FEIS Alignment and the Preferred Alternative proposals begin in the Wellesley Avenue vicinity, and continue heading Northward. North of Wellesley Avenue, the visual experience becomes restricted as the Preferred Alternative proposes a combination of "At Ground"/ "Depressed" elevations, paralleling the Hillyard Retail and Industrial area along an acquired railroad grade corridor just west of the FEIS Alignment.

North of Francis Avenue, the Preferred Alternative proposal crosses and continues parallel east of the FEIS Alignment. The two alignments converge for a short distance between the Lincoln Road/Fairview Road areas, and then split again.

The Preferred Alternative continues northward, cutting into the hillside to create a depressed section. It proposes to cross and connect with the SR 2 Interchange in a location Northeast of Farwell Road, continues cutting into the hillside, and curving due west. It transitions from a depressed section to a raised structure, before connecting to the US 395 Interchange in the Wandermere vicinity at a location southeast of the newly constructed US 395 bridge crossing the Little Spokane River.

Both the Preferred Alternative and the FEIS Alignment traverse gently hilly, heavily vegetated Residential and Rural areas, with few notable features. While the FEIS Alignment between US 2 and US 395 at Wandermere is on a raised section, the Preferred Alternative is in depressed section which severely limits views from the roadway.

The proposed depressed roadway sections will restrict the travelers' views of the existing surrounding terrain. These restrictions will, in certain locations, be beneficial to block visually distracting views from the traveler, depending on location and adjoining land uses.

Other views from the proposed “at ground elevation” and “raised” roadway locations will negatively impact the travelers' visual quality, due to the presence of numerous automobile wrecking yards, aggregate pits and quarries awaiting reclamation, petroleum storage areas, industrial complexes and storage yards, unkempt residential areas, and the increased automobile and truck traffic itself. These negative visual elements will become more apparent when the traveler is positioned atop expansive vertical curves of the "raised" roadway sections.

Views Toward the Facility

The assessment of the views toward the facility are similar resulting from the FEIS Alignment and the Preferred Alternative, although the corridors are in slightly different locations. The visual quality of the views toward the two alternatives of the proposed facility will continue to be impacted in a greater degree by the "raised" and “at ground elevation” roadway sections of the proposal than by the “depressed” roadway sections. Any proposed viaducts, bridges, and major arterial overcrossing structures will increase, and in certain instances, introduce the "Urban" visual element into undeveloped, rural, and residential neighborhoods.

"New Jersey" type concrete traffic barriers and lane delineators are anticipated to be constructed along both the FEIS Alignment and the Preferred Alternative on the "raised" roadway structures to delineate lanes and structure edges. These traffic barriers will also function to partially redirect tire noise. A substantial noise barrier structure, currently envisioned as an earthen berm, is proposed to be constructed along the western edge of the mobile home community located in the Mead, WA area. The original “at ground elevation” to “depressed” roadway section, which is located east of and paralleling the Hillyard retail area, will continue to propose a noise barrier structure to be constructed to mitigate noise impacts on the adjoining residential neighborhood and Wild Horse Park located eastward of the proposed alignment. This particular noise barrier structure should actually improve the visual quality within the neighborhood and park by screening out the traffic congestion and retail attributes of the downtown Hillyard corridor.

Light and Glare Impacts

Light and glare impacts are unchanged from the FEIS, p. 4-235.

Visual Impacts of Induced Growth

Visual impacts of induced growth are unchanged from the FEIS, p. 4-236.

Mitigation

Mitigating measures are unchanged from the FEIS, p. 4-236.

Irreversible and Irretrievable Commitment of Resources

In addition to the discussion of this topic in the FEIS, p. 4-276, the proposed Preferred Alternative abrogates a public investment made in the Morgan Acres neighborhood. See Environmental Justice discussion, this chapter, p. 26.

Relationship of Short-Term Uses of Environment and Long-Term Productivity

This topic is unchanged from the FEIS, p. 4-277.

Secondary and Cumulative Impacts

This topic is unchanged from the FEIS, p. 4-277 - 4-281.

Table 4.16 Alternative Route Comparison Summary

CATEGORY	FEIS Alignment: Market/Greene with North Option connection	Preferred Alternative: Revised Market/Greene with VE North connection
Regional and Community Growth	Cuts across Urban Growth Area in County.	Aligned with edge of Urban Growth Area in County.
Displacement and Relocations	123 homes, (90 single-family, 33 multi-family), and 1 church	112 homes (97 single family, 15 multi-family)
Land Use	total 244 hectares (602 acres)	total 255 hectares (629 acres)
Air Quality	no exceedance of NAAQS	no exceedance of NAAQS
Noise Impacts	220 homes impacted; 40 remain unmitigated by noise walls (FEIS, p. 4-28)	286 homes impacted; approx. 42-95 remain unmitigated by noise walls
Employment	40 businesses and approximately 795 employees displaced	35 businesses and approximately 345 employees displaced
Visual Quality	impacts over large residential area between US 2 and US 395 at Wandermere, Northwood Middle and Farwell Elementary Schools	impact reduced with depressed section north of Hawthorne
4(f) and 6(f) Sites; Historic, Parks and Recreation Sites	No properties taken or used	No properties taken or used
Geology and Soils	no significant impact	involves designated geologically hazardous soils
Topography and Sundry Sites	Extensive fill required for US 2 interchange	Extensive cuts required for US 2 interchange. Crosses Wilson Landfill, requiring excavation and filling
Wildlife and Habitat	no impact to unique habitat, threatened or endangered species	no impact to unique habitat, threatened or endangered species; increased impact to common habitat and species
Hazardous Waste	Estimated remediation south of Lincoln Rd: $1,752,000 Estimated remediation north of Lincoln Rd.: $445,000 (this figure not based on investigation.)	Estimated remediation south of Lincoln Rd.: $1,752,000 Estimated remediation north of Lincoln Rd.: $118,000.
No difference in impact in: Air Quality, Overall Economic Activity, Water & Hydrological Systems, Flood Plains, Wetlands, Prime Farmland.		